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High-performance Mg-ion conducting poly(vinyl alcohol) membranes: Preparation, characterization and application in supercapacitors

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ABSTRACT

The highly stretchable pure poly(vinyl alcohol) (PVA) membranes with high amorphicity and large ductility are prepared based on an N-methylpyrrolidone (NMP) solution. Meanwhile, the PVA based gel electrolyte membranes doped with magnesium trifluoromethanesulfonate ($Mg(Tf)_2$) and plasticized with 1-ethyl-3-methylimidazoliumtrifluoromethanesulfonate (EMITf) are fabricated with the NMP as the solvent. For the plasticized membranes, the 60PVA-40$Mg(Tf)_2$ + 10EMITf electrolyte system exhibits the highest room-temperature ionic conductivity (1.2×10^{-3} S cm^{-1}), excellent thermal performance and satisfying strength and flexibility. This

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